

**WHAT IS CLAIMED IS:**

1. A method of estimating path delays experienced by a received signal, the method comprising:
  - hypothesizing a plurality of path delays;
  - 5 for each of a plurality of measurement time slots and for each of the hypothesized path delays, making a measurement based on the received signal;
  - for each of the plurality of measurement time slots and for each of the hypothesized path delays, determining whether a fade occurred;
  - for each of the plurality of measurement time slots and for each of the hypothesized path delays, combining the measurement with a corresponding one of a plurality of cumulative metrics only if it was determined that no fade occurred; and
  - 10 for each of the plurality of hypothesized path delays, using the corresponding one of the plurality of cumulative metrics to determine whether the hypothesized path delay corresponds to a real path delay.
- 15 2. The method of claim 1, further comprising:
  - for each of the plurality of measurement time slots, combining the measurement with an additional cumulative metric whenever it is determined that no fades occurred for any of the hypothesized path delays; and
  - using the additional cumulative metric to determine whether a real path
  - 20 delay exists between two of the hypothesized path delays.
3. The method of claim 1, further comprising:
  - for each of the plurality of measurement time slots, combining the measurement with an additional cumulative metric; and
  - using the additional cumulative metric to determine whether a real path
  - 25 delay exists between two of the hypothesized path delays.
4. The method of claim 1, wherein the step of, for each of the plurality of measurement time slots and for each of the hypothesized path delays, combining the measurement with the corresponding one of a plurality of cumulative metrics only if it was determined that no fade occurred comprises adding the measurement to the

corresponding one of the plurality of cumulative metrics only if it was determined that no fade occurred.

5. The method of claim 1, wherein the measurement based on the received signal is an amplitude measurement of the received signal at a time corresponding to the hypothesized path delay during the measurement time slot.

6. The method of claim 1, wherein the measurement based on the received signal is an absolute value of an amplitude measurement of the received signal at the time corresponding to the hypothesized path delay during the measurement time slot.

7. The method of claim 1, wherein the measurement based on the received signal is a square of an absolute value of an amplitude measurement of the received signal at the time corresponding to the hypothesized path delay during the measurement time slot.

8. The method of claim 1, wherein the step of, for each of the plurality of measurement time slots and for each of the hypothesized path delays, combining the measurement with the corresponding one of the plurality of cumulative metrics only if it was determined that no fade occurred comprises:

for each of the plurality of measurement time slots and for each of the hypothesized path delays, coherently combining the measurement with the corresponding one of the plurality of cumulative metrics only if it was determined that no fade occurred.

9. The method of claim 1, wherein the step of, for each of the plurality of measurement time slots and for each of the hypothesized path delays, combining the measurement with the corresponding one of the plurality of cumulative metrics only if it was determined that no fade occurred comprises:

for each of the plurality of measurement time slots and for each of the hypothesized path delays, non-coherently combining the measurement with the

corresponding one of the plurality of cumulative metrics only if it was determined that no fade occurred.

10.           The method of claim 1, further comprising:  
              supplying the determined real path delays to RAKE receiver circuitry for  
5    use in receiving the received signal.
  
11.           The method of claim 1, wherein the step of, for each of the plurality of  
measurement time slots and for each of the hypothesized path delays, determining  
whether a fade occurred comprises:  
              for each of the plurality of measurement time slots and for each of the  
10   hypothesized path delays, using one or more previously determined channel estimates to  
determine whether a fade occurred.
  
12.           An apparatus for estimating path delays experienced by a received signal,  
the method comprising:  
              logic that hypothesizes a plurality of path delays;  
15        logic that makes a measurement based on the received signal for each of  
a plurality of measurement time slots and for each of the hypothesized path delays;  
              logic that determines, for each of the plurality of measurement time slots  
and for each of the hypothesized path delays, whether a fade occurred;  
              logic that combines the measurement with a corresponding one of a  
20   plurality of cumulative metrics for each of the plurality of measurement time slots and  
for each of the hypothesized path delays only if it was determined that no fade  
occurred; and  
              logic that uses the corresponding one of the plurality of cumulative  
metrics to determine whether the hypothesized path delay corresponds to a real path  
25   delay for each of the plurality of hypothesized path delays.
  
13.           The apparatus of claim 12, further comprising:

logic that combines the measurement with an additional cumulative metric whenever it is determined that no fades occurred for any of the hypothesized path delays for each of the plurality of measurement time slots; and

logic that uses the additional cumulative metric to determine whether a  
5 real path delay exists between two of the hypothesized path delays.

14. The apparatus of claim 12, further comprising:

logic that combines the measurement with an additional cumulative metric for each of the plurality of measurement time slots; and

logic that uses the additional cumulative metric to determine whether a  
10 real path delay exists between two of the hypothesized path delays.

15. The apparatus of claim 12, wherein the logic that combines the measurement with the corresponding one of a plurality of cumulative metrics for each of the plurality of measurement time slots and for each of the hypothesized path delays only if it was determined that no fade occurred comprises logic that adds the  
15 measurement to the corresponding one of the plurality of cumulative metrics only if it was determined that no fade occurred.

16. The apparatus of claim 12, wherein the measurement based on the received signal is an amplitude measurement of the received signal at a time corresponding to the hypothesized path delay during the measurement time slot.

20 17. The apparatus of claim 12, wherein the measurement based on the received signal is an absolute value of an amplitude measurement of the received signal at the time corresponding to the hypothesized path delay during the measurement time slot.

18. The apparatus of claim 12, wherein the measurement based on the  
25 received signal is a square of an absolute value of an amplitude measurement of the received signal at the time corresponding to the hypothesized path delay during the measurement time slot.

19. The apparatus of claim 12, wherein the logic that combines the measurement with the corresponding one of the plurality of cumulative metrics for each of the plurality of measurement time slots and for each of the hypothesized path delays only if it was determined that no fade occurred comprises:

5 logic that coherently combines the measurement with the corresponding one of the plurality of cumulative metrics for each of the plurality of measurement time slots and for each of the hypothesized path delays only if it was determined that no fade occurred.

20. The apparatus of claim 12, wherein the logic that combines the measurement with the corresponding one of the plurality of cumulative metrics for each of the plurality of measurement time slots and for each of the hypothesized path delays only if it was determined that no fade occurred comprises:

15 logic that non-coherently combines the measurement with the corresponding one of the plurality of cumulative metrics for each of the plurality of measurement time slots and for each of the hypothesized path delays only if it was determined that no fade occurred.

21. The apparatus of claim 12, further comprising:  
logic that supplies the determined real path delays to RAKE receiver circuitry for use in receiving the received signal.

20 22. The apparatus of claim 21, further comprising, the RAKE receiver circuitry.

23. The apparatus of claim 12, wherein the logic that determines, for each of the plurality of measurement time slots and for each of the hypothesized path delays, whether a fade occurred comprises:

25 logic that uses one or more previously determined channel estimates to determine, for each of the plurality of measurement time slots and for each of the hypothesized path delays, whether a fade occurred.